

Primary Care Physicians and Pandemic Influenza: an Appraisal of the 1918 Experience
and an Assessment of Contemporary Planning

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Abstract

This multidisciplinary research project examined the role of primary care physicians in past pandemic flu responses and current planning efforts. Project researchers gathered and synthesized historical research, state and federal planning documents, and interview-based data. The 1918 influenza pandemic presented one model from which to understand the role played by physicians during a large-scale disease outbreak, and the challenges they faced. Contemporary planning documents were assessed for their inclusion of primary care physicians. Literature reviews and interviews comprised the principal sources of information. Findings included the following: (1) primary care physicians do not have the time to engage fully in pandemic planning activities; (2) physicians are willing to serve during a pandemic; however, government support and the availability of resources will affect their level of involvement; (3) communities should develop plans for coordinating local physicians that will allow alternative care sites to be functionally staffed; and (4) full coordination of physicians is not possible under the U.S. healthcare system.

Introduction

Most infectious disease experts believe that the world stands on the verge of an influenza pandemic that could cause tens of millions of deaths.¹ The realization that the U.S. health care system is poorly prepared for such a disaster has prompted detailed planning, preparation, and practice for agencies from the local to the international level.² Primary care physicians, the initial providers of treatment for most Americans, will serve as a crucial arm of the public health response to an influenza pandemic. However, the autonomy with which most primary care physicians practice presents a challenge to the coordination of the public health system. The professional independence* of primary care physicians begs the following question: are primary care physicians adequately integrated into pandemic influenza preparedness planning? This paper aims to discuss the role of primary care doctors during an influenza outbreak. This will be accomplished by reviewing historical examples and examining current preparation and planning efforts.

Background, Rationale, and Research Question

Influenza is a highly contagious disease of the respiratory tract caused by one of several virus types. The A type virus is generally considered the most threatening to human populations, partially because of its ability to be quickly transmitted. The classification scheme for this type includes two antigen glycoproteins: hemagglutinin and neuraminidase. These are abbreviated as H and N, respectively, in the virus name.

* While physicians are very altruistic, the medical system in the U.S. does not provide systematic control over their practices. The vast majority of primary care physicians practice in private clinics—preventing direct government intervention in their work.

These two antigens are used to differentiate various serotypes based on their antibody response. The challenge in battling the Influenza A virus comes from its ability to undergo major genetic re-assortment in an animal host resulting in a novel strain. If this new strain becomes capable of human-to-human transmission, it could birth an epidemic and cause widespread morbidity and mortality.³ Such an epidemic could become a pandemic by moving through populations in more widespread geographical locations.⁴

Three major pandemics (1918, 1957, and 1968) of influenza have occurred in the past century.⁵ The 1918 pandemic, involving the H1N1 Influenza, was the most devastating. Mortality statistics for this pandemic, though only estimates, have changed since the first attempt (in 1927) to quantify the death toll. Eighty years ago, the American Medical Association estimated that 21 million people worldwide died during the 1918 pandemic. More recently, epidemiologists have estimated that the actual death toll was more likely around 50 million.⁶ The U.S. alone lost almost 675,000 people out of a population of 105 million; this represented 6.4 per cent of the population.⁷

When studying the U.S. healthcare response to the 1918 pandemic, it is clear that the medical system was overwhelmed. This was due in part to confusion regarding the precise cause of influenza. At the time, most physicians and researchers still believed it to be a bacterium, *Pfeiffer's bacillus*.⁸ This lack of understanding led to the trial of many therapeutic techniques. Everything from saline vaccines and opiates to cupping and bleeding was used to treat the seemingly unstoppable disease. Around the world, hospitals were so congested that "it was impossible to remove the dead

quickly enough to make room for the dying (p. 364).”⁶ Individual physicians were left virtually empty-handed in facing the disease.

The 1918 virus was especially virulent. A typical influenza pandemic produces a mortality rate of about 0.1 percent. The H1N1 virus of 1918 caused the death of 2.5 percent of those who contracted the virus.¹ The mortality was astonishing, but even more surprising was the age group that was most violently affected. Most disease pandemics, influenza or otherwise, cause the majority of deaths in the most susceptible segments of the population—the very young and the elderly. In this pandemic, by contrast, most deaths occurred among young adults in a war-time context.^{1, 6}

Since the aftermath of the 1918 pandemic, the world has seen multiple epidemics and two pandemics of influenza. Although science has advanced the understanding of the disease and improved the standard of treatment, social and technological changes (e.g., faster and more frequent international travel) could cause a pandemic to be more widespread.⁹ In addition, outbreaks of an avian influenza virus, especially in Asian countries, have spawned renewed fear of influenza’s virulence in the human population. During 2004, for example, Vietnam and Thailand both reported deaths associated with H5N1.^{1, 10} The number of confirmed human cases reported by the World Health Organization (WHO) has increased steadily, and a November 2007 report by the WHO estimates, on a worldwide basis, 335 cases and 206 deaths since 2003.²⁸ If this virus were to become transmissible between humans, it could spread with speed and mortality previously unseen in pandemics.

The potential for such devastation in the event of a pandemic has challenged governments, health agencies, and hospitals to prepare for such a disaster. Primary

care physicians, who will play a key role in the healthcare response, have been forced to consider how they should plan and prepare. However, in the midst of all the planning, some physician-based organizations have pointed out that most plans do not clearly provide for the involvement of primary care providers.

The American College of Physicians (ACP), with its 120,000 members, has been vocal in responding to this shortcoming.¹¹ In 2006, the ACP described its concerns about voids in the U.S. Department of Health and Human Services (HHS) Pandemic Influenza Plan. They noted that the HHS plan “provides a much needed step forward (p. 16)” but does not describe clearly how medical care will be rationed.¹² Additionally, the ACP voiced its concern regarding “the plan’s failure to thoroughly incorporate the role of physicians in non-hospital based settings in playing a leading role in the health care response (p. 16).”¹² They pointed out that this inadequacy could have serious consequences:

“Failure to integrate physicians in the local and state health care response plans will result in the underutilization of a key community resource and may contribute to an unnecessary bottleneck in the provision of patient care that will only serve to further strain the capacity of the nation’s hospitals for treating the most severely ill (p. 16).”¹²

This uncertainty—whether or not physicians are adequately integrated into pandemic response plans—must be addressed. Two important research questions emerge from this uncertainty:

1. What challenges to physician involvement were uncovered in past influenza pandemics, particularly the 1918 pandemic?
2. What challenges to physician involvement remain in today’s pandemic-flu planning?

Methodology

Personal interviews, database searches, and literature reviews were used to assess the effectiveness of public health preparedness measures, past and present; historical research and current planning efforts were examined. The history of influenza epidemics and the health care system's response to them was analyzed. The Centers for Disease Control and Prevention (CDC) and other public health agencies have identified the 1918 influenza pandemic as a model from which to understand this historical perspective.¹³ This pandemic was chosen because of its high mortality, speed of transmission, and breadth of impact. Two major historical works, *America's Forgotten Pandemic* by Alfred Crosby⁷ and *The Great Influenza* by John Barry,⁶ and other historical documents were consulted.

An analysis of current plans in order to understand the role of primary care physicians in influenza epidemics was conducted through a literature review and multiple interviews. PubMed¹⁴ and Google Scholar¹⁵ were used to search for articles and research focused on this aspect of public health planning. Multiple government planning documents were obtained and scrutinized for their inclusion of non-hospital based physicians. These included plans from the U.S. Department of Health and Human Services (HHS),¹⁶ the Kansas Department of Health and Environment (KDHE),¹⁷ and the World Health Organization (WHO).¹⁸ Researchers gathered and analyzed planning documents available from private primary care clinics and regional hospitals. As Table 1 indicates, multiple perspectives of the healthcare system were taken into account. By considering diverse elements of the healthcare system, a widely inclusive frame of reference was obtained (see Table 1).

TABLE 1: Areas of research and methods used

Disciplinary methods and areas of research	Databases consulted, major literature reviewed, and persons interviewed
Historical research regarding the role of physicians and the healthcare system in the 1918 pandemic	<ul style="list-style-type: none"> ▪ Journal Storage – JSTOR (keywords: 1918 influenza pandemic, influenza pneumonia pandemic) ▪ Sue Zschoche, PhD – Professor of History, Kansas State University, Manhattan, KS ▪ <i>The Great Influenza</i> by John Barry⁶ ▪ <i>America's Forgotten Pandemic: The influenza of 1918</i> by Alfred Crosby⁷ ▪ <i>Public Health: Past, Present, and Future</i> edited by Raj Bhopal and John Last¹⁹
Current planning	<p><u>Keyword reviews:</u></p> <ul style="list-style-type: none"> ▪ PubMed (keywords: pandemic influenza, primary care physicians and influenza, pandemic preparedness)¹⁴ ▪ Google Scholar (keywords: pandemic influenza, influenza preparedness)¹⁵ ▪ Kansas State University Library Catalog (keywords: pandemics, influenza planning)
	<p><u>Key informant interviews:</u></p> <ul style="list-style-type: none"> ▪ Howard Rodenberg, MD, MPH – Director of Division of Health (KDHE) ▪ Deborah Doubek, MD – Family Physician, Manhattan, KS and former president of the Kansas Medical Society ▪ Dane Ditto, MD – Family Physician, Manhattan, KS ▪ Joe Phillip, MD – Chief Medical Officer, Mercy Regional Health Center, Manhattan, KS ▪ Dan Leong, Kansas Hospital Association, Topeka, KS ▪ Mindee Reece, Director, Center for Public Health Preparedness, Topeka, KS

Results – Historical Research

During the 1918 outbreak of influenza, the healthcare system faced challenges from many directions. Some of the issues were circumstantial and specific to the time of the pandemic, while others arose from the fledgling public health system and the state of the medical establishment. There are four major factors that either (a) influenced why the 1918 pandemic overwhelmed the healthcare system or (b) prevented physicians from playing a more influential role in the pandemic response:

1. Uncontrollable circumstances of the time;
2. The government (federal, state, or local) supported public health system;
3. Coordination among the government, private agencies, and the public; and
4. The training, supply, and coordination of physicians.

The major historical event that influenced the unfolding of the 1918 pandemic was World War I (WWI). The preparations for the war, especially in the U.S., involved a massive build-up of troops, concentrating men from different geographic areas and facilitating the rapid transmission of the virus.⁶ Additionally, the military expansion necessary for war created a shortage of medical personnel, including physicians and nurses. This directly decreased the quality and amount of healthcare available to the civilian population during the pandemic. Although the war contributed to the effects of the pandemic, it also provided some benefits to the advancement of public health. According to Dr. Sue Zschoche, Professor of History at Kansas State University (Interview, April 2007), the military was able to keep precise data regarding the spread of the virus through its personnel, the efficacy of various treatments, and the mortality of the virus. These records enabled researchers to learn much from the events of 1918.

In 1918, the major government entity charged with battling infectious disease was the United States Public Health Service (USPHS). However, when the pandemic

struck, this federal agency was poorly equipped to handle the massive demand of leadership and resources. While many states and locales had their own public health departments, these independent agencies were not integrated effectively at the national level. This lack of cooperation created a challenge for the USPHS to gather data and to organize personnel for the needs of individual communities.⁷

Local public health departments began to appear in America shortly after the U.S. Civil War (1861-1865) and would, for at least the next fifty years, struggle to define their roles and implement services into the larger systems of healthcare and medicine.²⁰ These programs were largely born out of the sanitary campaigns of the mid-1800s and were relatively insignificant at the turn of the century—focusing almost entirely on the physical environment of the community.²¹ However, as science began to unravel the microbiological causes of human disease, public health began to develop as a science of its own. The significance of this new field was reflected in the founding of the first institution devoted specifically its study—the Johns Hopkins School of Hygiene and Public Health in 1918.* As a response to new discoveries linking individual illness with disease transmission, public health departments began to assume broader roles including some aspects of diagnostic medicine. This widening of responsibility spawned conflict between physicians and health departments; physicians strongly objected to the “actual or potential encroachment on the area of medical practice and its economic

* Ironically, William H. Welch, the first dean of the school, was not able to attend the opening ceremonies on October 1, 1918. He was sick – likely suffering from contraction of influenza, the very disease that his prestigious institution was battling.⁶ Though the Johns Hopkins School of Hygiene and Public Health was the first of its kind in the U.S., Europe had recognized public health’s value years before. In October 1902, The John Usher Institute of Public Health was established at the University of Edinburgh in Scotland. This institution was largely responsible for the development of Edinburgh, once a city of stench and filth, into one of the twentieth century’s greatest cities.¹⁹

aspect (p. 42).”²¹ Disagreement over the jurisdiction of physicians and health departments contributed to a public health system that was neither organized nor effective. Physicians viewed the treatment of patients by public health departments as government funded competition to their businesses and the required reporting of certain diseases as an infringement on the patient-doctor relationship.²⁰ While public health departments sought to curb disease transmission by treating patients, physicians contended for the sovereign right to diagnose and cure.²¹

Despite the disagreement with physicians over their respective roles, the influence of public health was strong in the early 20th century. From 1904 to 1924, the number of physicians employed by public health departments grew steadily.²¹ These agencies were riding on the wave of effective campaigns such as that of New York City’s Metropolitan Board of Health (1866) and the National Association for the Study and Prevention of Tuberculosis (1905-1915).²⁰ Although their programs and campaigns were somewhat influential, public health departments lacked robust authority and struggled to collaborate with physicians; public health departments were unable to require the reporting of communicable diseases by doctors in private practice.²⁰ This produced a system that was ineffective at gathering data on epidemic disease and contributed to the difficulty for the healthcare system to mount an appropriate response to the 1918 influenza.⁷ Over time, public health departments would take an auxiliary role to physicians and their efforts in diagnosis and treatment.²⁰

As the war put a demand on the supply of physicians and the government scrambled to organize and disperse those that remained, the entire healthcare system struggled to find solutions, leadership, and direction in the face of influenza. Multiple

organizations, from both the government and the private sector, attempted to meet the seemingly immeasurable demand for healthcare. The American Medical Association (AMA) appealed to its membership for service to flu victims.⁷ The American Red Cross made an effort to organize both nurses and physicians.⁶ The USPHS, ill-equipped and unprepared, tried to coordinate and ration healthcare to the most needed cities and states.⁶ These efforts failed to designate a central point of leadership: a primary coordinator of medical personnel.

Clearly, one of the greatest challenges for the medical system in 1918 was the inability of physicians to treat influenza correctly and consistently. Initially, this reality was not realized by the scientific and medical community. In fact, the director of Philadelphia's laboratories stated that *Pfeiffer's bacillus* had been isolated as the cause of influenza. It was reported that this finding "armed the medical profession with absolute knowledge on which to base its campaign against this disease (p. 72)."⁷ Recently armed with advances stemming from germ theory and bacteriology, the revelation that no medicine, vaccine, or plan of care was effective was a blow to the medical community. Not even masks, distributed by the millions, were thwarting contraction of the disease.⁶ Preventing exposure by strict quarantine or isolation was the only tactic that proved effective.²² Other historical accounts, regarding outbreaks of yellow fever in the 1870s for instance, confirm that physicians themselves often struggled to apprehend the cause, symptoms, and treatment for infectious diseases.²⁹ While progress in sanitation was most important in making progress against yellow fever, physicians have consistently provided leadership; physicians in Philadelphia, for instance, were early to recognize the problem posed by mosquitoes.³⁰

The second collective problem in 1918 was that there were simply not enough medical doctors. The shortage of both doctors and nurses left the general public scrambling for healthcare and advice. This was compounded by the military's increasing demand for medical personnel in the war effort. Tens of thousands of physicians were called upon to serve the country's needs in WWI, and the military accepted only those physicians who were qualified. By the end of the war, 38,000 physicians were serving the military. This left the general American public with a reduced supply of physicians, and an even smaller supply of competent and well-educated doctors.⁶

As the outbreak wreaked havoc on communities, facilities were created or expanded to deal with the sick, the dying, and the dead. These haphazardly thrown together facilities placed doctors, nurses, orderlies, and other key problem solvers in an environment that increased their risk of contracting the virus. Indeed, a great number of them acquired influenza and fell ill.^{7,13}

While the shortage of physicians alone was a significant burden on the healthcare system, challenges arose with regard to identifying properly licensed and qualified doctors. The military did not accept physicians over the age of forty-five; as a result, the civilian population was left with many doctors who had been trained in archaic and non-scientific ways of medicine.⁶ The government struggled to coordinate the remaining competent physicians. In January 1918, the Council of National Defense created the Volunteer Medical Service Corps (VMSC); the VMSC provided the USPHS with a list of physicians willing to serve.⁷ The enrolled physicians were not enlisted in the military for various reasons but had been graded as competent by a local medical

committee.²³ Unfortunately, the effort failed as the virus spread ubiquitously. Doctors had to tend to their own patients and the government's pay—\$50 a week—was not a compelling incentive.⁶ The VMSC had an enrollment of 72,219 physicians at the end of WWI, but only 1,045 physicians would actually serve the USPHS through the corps.²³

Results – Current Planning

In preparing for pandemic influenza, planning authorities have made several assumptions to help order ideas and strategies. These include (1) a pandemic is inevitable;²⁴ (2) infection rates will be high, most likely 30% of the population;¹⁶ (3) the healthcare system will be strained, and care will have to be rationed;^{12, 24} (4) there will be high mortality;^{16, 24} and (5) it will cause both economic and social disruption.²⁴ These assumptions, along with others, have guided planning by agencies around the world. This endeavor has been led by the WHO, which released its plan in 1999.

The U.S. Department of Health and Human Services (HHS) plan¹⁶, released in October 2004, provides for primary care physicians in several ways. It is divided into two parts; the first is a strategic plan on a national scale, and the second is a guide for state and local health partners.¹⁶ The latter provides supplemental planning guides to help both hospitals and non-hospital practices (including private medical practices) develop plans for operation during a pandemic. It acknowledges that “management of outpatient influenza cases will reduce progression to severe disease and thereby reduce demand for inpatient care (pg. 13).”¹⁶ Consequently, the HHS plan provides nine recommendations to non-hospital healthcare facilities. These include development of written plans, determination of communication strategies, coping with affected staff and employees, and procurement of supplies.¹⁶ Another supplement in Part 2 of the plan

contains clinical guidelines to aid physicians and other healthcare personnel in identifying, classifying, and treating influenza cases.¹⁶ The HHS makes recommendations to state and local health authorities concerning priority groups for vaccination. Medical workers and healthcare workers are included in the first tier and sub-tier of this prioritization.¹⁶ Lastly, the monitoring of influenza cases is referred to under the presently existing “Sentinel Provider Network,” a collaboration of 2,300 physicians and health departments across the U.S. which are responsible for reporting cases of influenza.¹⁶

In October 2005, the KDHE released the Kansas Pandemic Influenza Preparedness and Response Plan.^{17*} This plan was based on planning recommendations from the CDC and WHO. It addresses the strain that hospitals will face in the event of a pandemic, but it does not specifically address physician offices or clinics. KDHE responsibilities in the plan include maintaining the Public Health Information Exchange (PHIX) System to communicate information to both public health officials and healthcare professionals. Additionally, the plan acknowledges that the State Health Officer has convened a task force to “ensure that the medical community is made aware of issues related to pandemic influenza (p. 16).”¹⁷ This task force has been working with organizations such as the Kansas Medical Society (KMS) and the Kansas Hospital Association (KHA) to detail the responsibilities of physicians and hospitals.

The ACP’s response to the HHS plan is directed at the aspects of the plan that “explicitly or implicitly call for the involvement of physicians.”²⁶ The College’s position is outlined in nine different positions. These positions are summarized in Table 2.

* In a 2006 report by the Trust for America’s Health, Kansas ranked second in the nation for public health emergency preparedness.²⁵

TABLE 2: The ACP's response to the HHS Pandemic Influenza Plan²⁶

Component of the HHS Pandemic Influenza Plan	ACP position and/or recommendation
The development of local pandemic influenza task forces	<ol style="list-style-type: none"> 1) Physicians should be integrated into the local task forces. 2) All physicians should be provided with a copy of state and local plans. 3) Strategies should be developed for the procurement of medical supplies for health care providers.
Communication between public health authorities and physicians	<ol style="list-style-type: none"> 1) The Sentinel Provider Network (SPN), which currently is used to monitor influenza cases, should be expanded to include more physicians. 2) Communication systems should be identified and developed which are easy to use and accessible to physicians.
Identification of volunteer emergency health care providers	<ol style="list-style-type: none"> 1) Plans should identify the agency responsible for the oversight of volunteers. 2) Volunteer's licensing should be verified by an agency with the proper authority.
Distribution of vaccine and antiviral medications	<ol style="list-style-type: none"> 1) The current system for delivering seasonal flu vaccine should be improved and streamlined. 2) Plans should ensure that physicians will have access to vaccine and antiviral medications.
The use of nonhospital-based health care providers	<ol style="list-style-type: none"> 1) Physicians should be consulted to find the alternative sites. 2) Physician leadership should be established for the staffing and supplying of alternative care sites.

Howard Rodenberg, Director of the Division of Health within KDHE, is the primary official responsible for pandemic flu planning in Kansas. When presented with the ACP's analysis during an interview (January 2007), Rodenberg commented, "In a lot of ways, the ACP has it right." He noted, however, that in planning for pandemic illness, the federal government does not deal with the individual practitioner; they deal with institutions (e.g., the Kansas Medical Society, the Kansas Hospital Association, etc.). The following question is begged: is there a role for the individual practitioner?

“Absolutely,” responded Rodenberg. He described this role as having three parts: (1) being a clinician and treating patients, (2) serving to educate the public, and (3) serving as a leader for their community. When asked if physicians are aware of these roles and capable of fulfilling them, Rodenberg answered, “As scientists, the physicians are fully capable and have the public’s best interests in mind.” He added, “Physicians are busy people and it is hard for them to find time to attend more meetings.”

This conflict between the need for physicians to be involved in planning and their lack of time to do so was echoed by other officials and by physicians themselves. Mindi Reece, Director of the Kansas Center for Public Health Preparedness, is charged with guiding the Kansas Pandemic Flu Task Force. This CDC-funded multidisciplinary task force is responsible for building a comprehensive planning document for pandemic flu that incorporates many agencies and organizations. “It has been a challenge to get doctors involved,” admitted Reece during a phone interview (April 2007). The task force involves a group of physicians through the University of Kansas Medical Center.

Clearly, physician involvement in pandemics is a critical factor in the healthcare system’s response. However, given the complexity and qualitative nature of the topic, peer-reviewed research is scarce. In a study conducted in 2006, 744 emergency and primary care physicians were surveyed about their preparedness for incidents of bio-terrorism and other potential public health emergencies.²⁷ A majority of primary care physicians—seventy-seven percent—described influenza as being a greater threat to public health than bio-terrorism. Ninety-three percent of them responded that their local health care system needs to be prepared for epidemics such as flu, but only forty-seven percent of them felt that the system was prepared already. The survey also probed the

issue of the willingness of physicians to serve during a pandemic. Fifty-one percent of primary care providers said they would volunteer in a medical reserve corps. Fifty percent of them said they would be willing to put their lives at risk of contracting the illness if it was the only way to save the lives of others.²⁷

A qualitative study published by Australian researchers in 2006 addressed general practitioners' response to pandemic influenza.³ Each of the subjects interviewed indicated that they would continue to work during a pandemic. However, this willingness was somewhat dependent upon supportive "education, training, and supply of equipment (p. 267)".³ For example, fifty-five out of sixty of those interviewed said they would cease to work if personal protective equipment (e.g., gloves and masks) was not available. They insisted that the government had a responsibility to provide such equipment in the event of a pandemic. Additionally, many of the participants cited the care of their own patients as their primary responsibility. They expressed concern that serving at an alternative care site would compromise the well being of their patients.³

Discussion and Conclusions

This paper considered physician involvement in the 1918 influenza pandemic and the inclusion of primary care physicians in planning efforts for another similarly-daunting pandemic. There are, admittedly, many differences between 1918 and today. For example, it is clear that the troop movement and concentration involved with WWI had a dramatic effect on the spread of the 1918 virus. Meanwhile, global travel by infected individuals is more likely today than in 1918.

In light of the 1918 pandemic and current discussions and plans regarding influenza, the following conclusions can be made:

- 1) *Primary care physicians do not have the time to engage fully in pandemic planning activities.* Consequently, they must be informed, organized, and led through key community officials or appointed leaders.
- 2) *Physicians are willing to serve during a pandemic. However, government support and the availability of resources will affect their level of involvement.* Physicians generally possess an attitude of altruism and public service. However, as the risk to their own health (and that of their staff and families) increases, the willingness of physicians to serve will diminish. Planning must provide for physicians to have access to vaccines, antivirals, and protective equipment.
- 3) *Communities should develop plans for coordinating local physicians that will allow alternative care sites to be functionally staffed.* Most physicians work within a private practice. During an influenza pandemic, they will work first to ensure that their own patients are cared for. This will leave few physicians to fill volunteer roles. Alternative care sites (e.g., schools, churches, etc.) established for the excess patient load will not help if they do not have sufficient medical personnel.
- 4) *Full coordination of physicians is not possible under the U.S. healthcare system.*
The historical development of medical practice in the U.S. has contributed to a system in which physicians work independently of public health agencies. There will not be a monolithic, standard response by physicians; physicians will choose to respond to pandemic conditions differently. No amount of planning or coordination can account for all the variables involved in the healthcare system's response, including physician involvement. Energy should instead be devoted to providing doctors with general resources, information, and support.

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